REMARKS

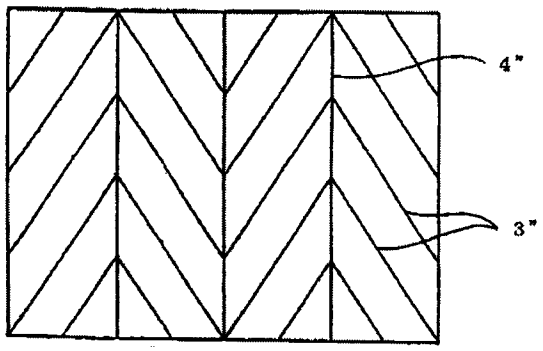
Claims 1 and 2 stand rejected under 35 U.S.C. § 102(b) as being anticipated or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Beckmann et al. (USPN 5,350,001). Claims 1 and 2 have been cancelled rendering this rejection moot.

Claims 3-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Beckmann in view of Lagnier '965 (USPN 4,794,965) and Lagnier '002 (USPN 5,783,002). Applicants traverse this rejection because the cited prior art references, taken alone or in combination, fail to disclose or suggest a sipe where a zigzag shape with an amplitude in the tire radial direction is formed in each of the bent portions, and where the amplitude of the bent portions in the tire radial direction is larger near a bottom of the sipe than near the tread surface, as recited in independent claim 3.

Beckmann discloses that a lamella is used to form fine cut-outs in a tread surface of a tire. Each lamella is a three dimensional object that is formed from a thin sheet of material by bending the material along bending lines 3" and 4". The bending lines 3" of Beckmann are displaced linearly by an amount C, and form an angle α" relative to the bending lines 4", as shown in Fig. X below, which corresponds to Fig. 3A of Beckmann. However, Beckmann fails to disclose a zigzag shape formed in each of the bent portions of a sipe, as recited in claim 3. Moreover, Beckmann fails to disclose that a tilt angle of the cut-outs with respect to a normal line in the tire circumferential direction is smaller near the bottom of the cut-out than near the tread surface. Finally, Beckmann does not teach that an

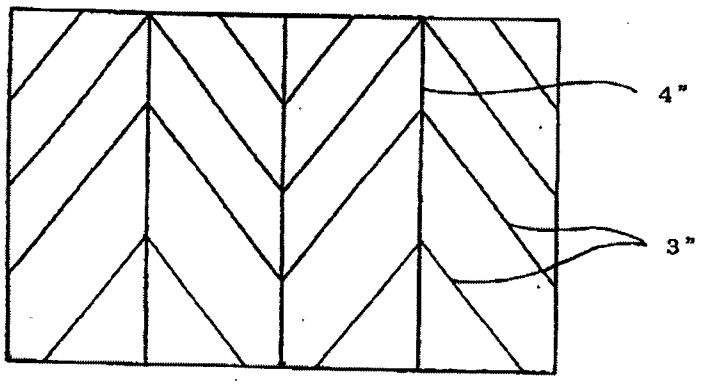
amplitude of the cut-out in the tire radial direction is set larger at a bottom portion of the cut-out than near the tread surface.

Fig.X



Lagnier '965 shows in Fig. 3C, that a tire includes incisions 710, 711, that maintain a constant amplitude α in a tire circumferential direction, while a wavelength λ of the incision increases as a function of the depth of the incision. The combination of the amplitude α and the wavelength λ results in an incision having a tilt angle θ, measured with respect to a normal line to the tread surface, that decreases as a function of depth of the incision. In order to incorporate these features of Lagnier '965 into the cut-outs of Beckmann, it is necessary that the amplitude of each of the bending lines 3" of Beckmann remain constant, while the linear distance between bending lines 3" increases as a function of depth. This configuration is shown in Fig. Y below.

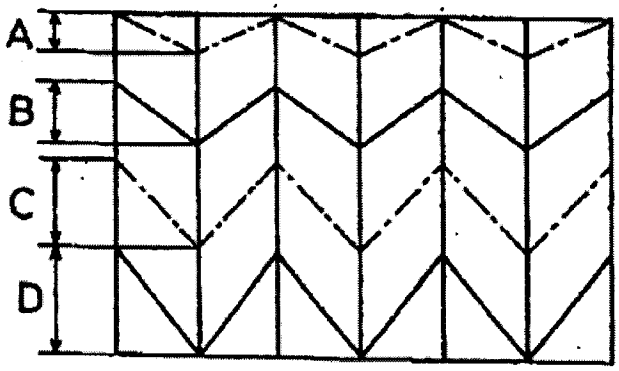
Fig.Y



Lagnier '002 shows, in Fig. 4, that an incision in a tire has a wavelength λ_A and an amplitude α_A that remain constant over the entire length of a horizontal trace OA (i.e., a trace in the tire axial direction). A wavelength λ_B in the tire radial direction also remains constant, while an amplitude α_B of the incision in the tire circumferential direction decreases as a function of depth. However, Lagnier '002 is silent regarding a line extending in the tire axial direction and having a zigzag shape with an amplitude in the tire radial direction. Moreover, because Lagnier '002 does not describe a line having a zigzag shape, it necessarily follows that the reference also fails to disclose that an amplitude of the line increases as a function of the depth of the incision.

In contrast, as shown in Fig. Z below, the present invention teaches that bent portions of the sipe extend in a tire widthwise direction and have amplitudes A, B, C, and D in the tire radial direction, as recited in claim 3. Moreover, in can be seen that the amplitudes A, B, C, and D increase as a function of the depth of the sipe.

Fig.Z



This construction advantageously enhances tire performance during both braking and cornering, while still allowing the tire to be easily released from a mold. Because Beckmann, Langier '965 and Langier '002, whether taken alone or in combination, fail to disclose a zigzag shape with an amplitude in the tire radial direction formed in each of the bent portions, where the amplitude of the bent portions in the radial direction is set larger at a portion closer to the bottom of the sipe than in a portion closer to the tread surface, applicants respectfully request withdrawal of the rejection.

Claims 10 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Beckmann, Langier '965 and Langier '002, in view of Tagashira et al. (JP 09323511). Claims 10 and 11 ultimately depend from claim 3, and thus include all the features of claim 3, plus additional features. Accordingly, respectfully request withdrawal of the rejection of claims 10 and 11 in light of the above remarks direction to claim 3, and because Tagashira does not remedy the deficiencies identified with respect to claim 3.

Claims 10 and 11 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Beckmann, Langier '965, and Langier '002, in view of Tagashira and Iga et al. (JP 2002-192916). As stated above, claims 10 and 11 ultimately depend from claim 3. Accordingly, respectfully request withdrawal of the rejection for the reasons recited above with respect to claim 3, and because Tagashira and Iga do not remedy the deficiencies identified with respect to claim 3.

For the foregoing reasons, applicants believe that this case is in condition for allowance, which is respectfully requested. The examiner should call applicants' attorney if an interview would expedite prosecution.

The Commissioner is hereby authorized to charge fees which may be required to this application under 37 C.F.R. §§1.16-1.17, or credit any overpayment, to Deposit Account No. 07-2069.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 

Kevin T. Bastuba
Registration No. 59,905

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300 South Wacker Drive
Suite 2500
Chicago, Illinois 60606
Telephone: 312.360.0080
Facsimile: 312.360.9315

Customer No. 24978